What the invention claimed is:

1. A fiber optics ferrule calibrating instrument comprising:

(a) a high-precision ceramic calibrating unit adapted to automatically load the selected high-precision ceramic fiber optics ferrule calibration axle into position, to set the stroke of the high-precision ceramic fiber optics ferrule calibration axle subject to a predetermined calibrating depth, and to automatically replace the high-precision ceramic fiber optics ferrule calibration axle when the wear rate of the high-precision ceramic fiber optics ferrule calibration axle surpassed the wear allowance;

(b) a metal casing positioning unit adapted to fix the metal casing of the fiber optics ferrule to be calibrated in position, enabling an auto feed control unit to automatically move the metal casing of the fiber optics ferrule into the calibrating position;

(c) a ceramic purification high pressure gas source unit adapted to remove dust or metal chip from the high-precision ceramic fiber optics ferrule calibration axle in use after each calibrating action, eliminating variation of tolerance;

(d) a laser caliber gauge adapted to detect the dimensional tolerance of the high-precision ceramic fiber optics ferrule calibration axle in use, and to feedback the detection data to a data file, enabling the high-precision ceramic calibrating unit to automatically replace the high-precision ceramic fiber optics

ferrule calibration axle when the wear rate of the high-precision ceramic fiber optics ferrule calibration axle surpassed the wear allowance;

(e) a power unit, which provides the whole system of the fiber optics ferrule calibrating instrument with the necessary power;

(f) an auto feed control unit adapted to automatically move the metal casing of the fiber optics ferrule into the calibrating position for calibration; and

(g) an auto feedback control unit adapted to receive and analyze all system signal data, and to output the accurate operation signal subject to the analyzed result.

2. The fiber optics ferrule calibrating instrument as claimed in claim 1, which is a multi-axle calibrating instrument adapted to calibrate a plurality of fiber optics ferrules at a time.

3. The fiber optics ferrule calibrating instrument as claimed in claim 1, wherein said high-precision ceramic calibrating unit is adapted to calibrate the inner diameter with a cylindrical high-precision ceramic fiber optics ferrule calibration axle and the outer diameter of a fiber optics ferrule with a high-precision ceramic fiber optics ferrule calibration axle having a calibrating bottom recess.

4. A fiber optics ferrule precision improvement apparatus

comprising a ceramic fiber optics ferrule calibrating axle controlled to insert into the inner diameter or sleeve onto the outer diameter of a fiber optics ferrule, so as to expand the inner diameter or compress the outer diameter of the fiber optics ferrule, calibrating the inner diameter or outer diameter of the fiber optics ferrule to the dimension tolerance and roundness approximately equal to the ceramic fiber optics ferrule calibrating axle, and keeping the tolerance of the fiber optics ferrule within 1~3 μm.

5. The fiber optics ferrule precision improvement apparatus as claimed in claim 4, wherein the material of said high-precision ceramic fiber optics ferrule calibration axle is of block or thin-film material.

6. The fiber optics ferrule precision improvement apparatus as claimed in claim 5, wherein the material of said high-precision ceramic fiber optics ferrule calibration axle contains oxide compound, carbon compound, nitrogen compound, or their mixture.

7. The fiber optics ferrule precision improvement apparatus as claimed in claim 6 wherein said oxide compound includes Al_2O_3, ZrO_2, Cr_2O_3, TiO_2; said carbon compound includes WC, TiC, SiC, B_4C, ZrC, TaC, HfC, Cr_3C_2, NbC; said nitrogen compound includes Si_3N_4, TiN, ZrN, HfN, BN, AlN.

8. The fiber optics ferrule precision improvement apparatus as claimed in claim 5, wherein the material of said high-precision

ceramic fiber optics ferrule calibration axle contains boric compound, diamond, or artificial diamond.

9. The fiber optics ferrule precision improvement apparatus as claimed in claim 5, wherein said thin film fabrication includes CVD fabrication and PVD fabrication.

10. The fiber optics ferrule precision improvement apparatus as claimed in claim 4, wherein the fabrication of the ceramic fifer optics calibrating axle includes the steps of ceramic powder pre-treatment process, ceramic powder activation process, blank axle body formation process, sintering process, and high-precision grinding process.

11. The fiber optics ferrule precision improvement apparatus as claimed in claim 10, wherein said blank axle body formation process can be one of the processes including die casting process, dry sand molding process, extruding process, injection-molding process, hot press molding process, and cold press molding process.

12. The fiber optics ferrule precision improvement apparatus as claimed in claim 10, wherein the blank axle body thus obtained from said blank axle body formation process is then sintered into a hard axle of relative density within 40%~100% through said sintering process.

13. The fiber optics ferrule precision improvement

apparatus as claimed in claim 10, wherein the sintered axle thus obtained from said sintering process is then processed into the desired ceramic fiber optics ferrule calibration axle through said high-precision grinding process, which is a mirror grinding process.